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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/887,953	06/22/2001	Varouj Amirkhahian	1031/205	7677

26588 7590 03/13/2002

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EXAMINER

COUNTS, GARY W

ART UNIT PAPER NUMBER

1641

DATE MAILED: 03/13/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/887,953

Applicant(s)

AMIRKHANIAN, VAROUJ

Examiner

Gary W. Counts

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 25 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 19 and 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election with traverse of Group I, claims 1-18 in Paper No. 3 is acknowledged. The traversal is on the ground(s) that the language of the limitations in independent claim 19 substantially parallels the language used in claim 1. Applicant has amended claim 19. However, the claims are still patentably distinct. This is not found persuasive because restriction requirements are set forth for reasons patentable distinction between each independent invention so as to warrant separate classification and search. The record set forth in the previous restriction requirement clearly indicated that the delineated inventions are in fact patentably distinct each from the other or independent from the other. The requirement is still deemed proper and is therefore made **FINAL** for reasons of record.

### ***Specification***

The disclosure is objected to because of the following informalities:

On page 1, lines 7 and 9, the blank spaces need to be answered with the appropriate application no.

On page 12, line 15, the blank space needs to be answered with the appropriate application no.

On Page 22, line 8, the blank space needs to be answered with the appropriate application no.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 11, the recitation "introducing excitation radiation axially" there is insufficient antecedent basis for this limitation. Claim 11 should depend from claim 3.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 10, and 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhu et al (US Patent 5,763,277).

Zhu et al disclose a detection system which comprises a capillary tube (col 6, line 46) used for electrophoresis (separation channel) (col 2, lines 49-51) which defines a detection zone. Zhu et al disclose that sample analyte fluorescence is caused to occur by the application of energy (excitation radiation) to sample analytes caused to be present within the system (col 1, lines 62-65, see also figure 1). Zhu et al disclose the use of an axially oriented fiber optic which is directed into an end of the detection section in proximity to the detection zone. Zhu et al disclose that this fiber optic

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transmits the produced fluorescence (radiation emission) to a detector system (col 3 lines 1-6, see also figure 1). Zhu et al also disclose that the inner diameter of the axially oriented system component is increased at the location of contained axially oriented fiber optic means (cool 5, lines 1-3).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patent ability shall not be negative by the manner in which the invention was made.

4. Claims 3, 4 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al (US Patent 5,763,277) in view of Taylor et al (Axial-beam Laser-Excited Fluorescence Detection In Capillary Electrophoresis, Anal. Chem. 1992, Vol. 64, 1741-1744).

See above for teachings of Zhu et al.

Zhu et al differ from the instant invention in failing to teach a means for introducing excitation radiation axially at the detection zone. Zhu et al also fails to teach a boundary material that surrounds the light emitting material for guiding the excitation radiation from the excitation source to the detection zone.

Taylor et al disclose the use of an optical fiber which focuses the excitation laser beam which directs the light along the capillary rather than across it. Taylor et al also disclose that this fiber is inserted into the separation capillary (col 1, page 1742, lines 6-10). The use of this optical fiber allows for axial-beam fluorescence excitation which

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provides the added advantage of very little scattered light originating from the capillary walls which allows the use of capillaries with intact polyamide coatings without problems of interference due to absorption or greatly increased fluorescence background. It also provides for a longer absorption path length compared to irradiation across the capillary (col 1, page 1741, lines 35-47). Taylor et al also disclose the use cladding material and a jacket which surround the fiber for guiding the excitation radiation from the excitation source to the detection zone.

It would have been obvious to one of ordinary skill in the art to incorporate the use of a fiber and a surrounding material as taught by Taylor et al into the detection system of Zhu et al because Taylor et al shows that the use of this fiber and surrounding material allows for axial-beam fluorescence excitation which provides the added advantage of very little scattered light originating from the capillary walls which allows for the use of capillaries with intact polyamide coatings without problems of interference due to absorption or greatly increased fluorescence background. It also provides for a longer absorption path length compared to irradiation across the capillary.

With respect to the light transmitting material having a refractive index greater than the refractive index of the boundary material as recited in the instant claims. It would have been obvious to one of ordinary skill in the art to incorporate a light transmitting material which has a refractive index greater than the refractive index of the boundary material because this would allow one to maintain the light with the fiber optic so that loss of the intensity of the light would not occur.

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5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al (US Patent 5,763,277) in view of Taylor et al as applied to claims 1-4, and 10-18 above, and further in view of Letcher et al (US Patent 6,326,213).

See above for teachings of Zhu et al and Taylor et al.

Zhu et al differ from the instant invention in failing to teach the means for axially detecting radiation emission shares the same single fiber as the means for introducing excitation radiation axially to transmit excitation radiation and radiation emission.

Letcher et al disclose a single step-tapered fiber used for excitation and detection (col 3, lines 1 and 2, see also abstract). The use of this fiber allows for enhancement of the sensitivity of a fiber-optic biosensor using fluorescent immunoassay techniques for the rapid detection of a pathogen.

It would have been obvious to one of ordinary skill in the art to incorporate the fiber of Letcher et al into the detection system of Zhu et al because Letcher et al shows that the used of this fiber allows for enhancement of the sensitivity of a fiber-optic biosensor using fluorescent immunoassay techniques for the rapid detection of a pathogen.

6. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhu et al, in view of Taylor et al and Letcher et al as applied to claims 1-5 and 10-18 above, and further in view of Hazman et al (US Patent 5,625,403).

See above for teachings of Zhu et al, Taylor et al, and Letcher et al.

Zhu et al differ from the instant invention in failing to disclose a confocal optical element that transmits excitation radiation and radiation emission.

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Hazman et al disclose the use of a dichroic beam combiner along with a set of lens. This dichroic beam combiner is used to selectively reflect and transmit light according to its wavelength (col 4, lines 30-33). The use of the beam combiner and set of lens allows for the combination of laser beams and enabling the realization of a practical high power optical head.

It would have been obvious to one of ordinary skill in the art to incorporate the beam combiner and set of lens as taught by Hazman et al into the detection system of Zhu et al because Hazman et al shows that the use of the beam combiner allows for selectivity of light reflection and transmission according to its wavelength and the beam combiner and set of lens also allows for the combination of laser beams and enabling the realization of a practical high power optical head.

### ***Double Patenting***

7. Claims 1-18 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims of copending Application No. 09/887871. Although the conflicting claims are not identical, they are not patentably distinct from each other because it would have been obvious to one of ordinary skill in the art to incorporate the radiation in certain directions in order to optimize the measurement of the signal.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.



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**Conclusion**

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Taylor et al (Multiplexed Fluorescence Detector for Capillary Electrophoresis Using Axial Optical Fiber Illumination) discloses multiplexed detection in capillary electrophoresis

Yin et al (US Patent 5,650,846) et al disclose a microcolumnar analytical system with optical fiber sensor which axially detects light.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary W. Counts whose telephone number is (703) 305-1444. The examiner can normally be reached on M-F 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (703) 305-3399. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-4242 for regular communications and (703)3084242 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.



Gary W. Counts  
Examiner  
Art Unit 1641  
March 1, 2002



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03/01/02